

# WORLD ENERGY OUTLOOK

## Global Energy Dynamics: Outlook for the Future

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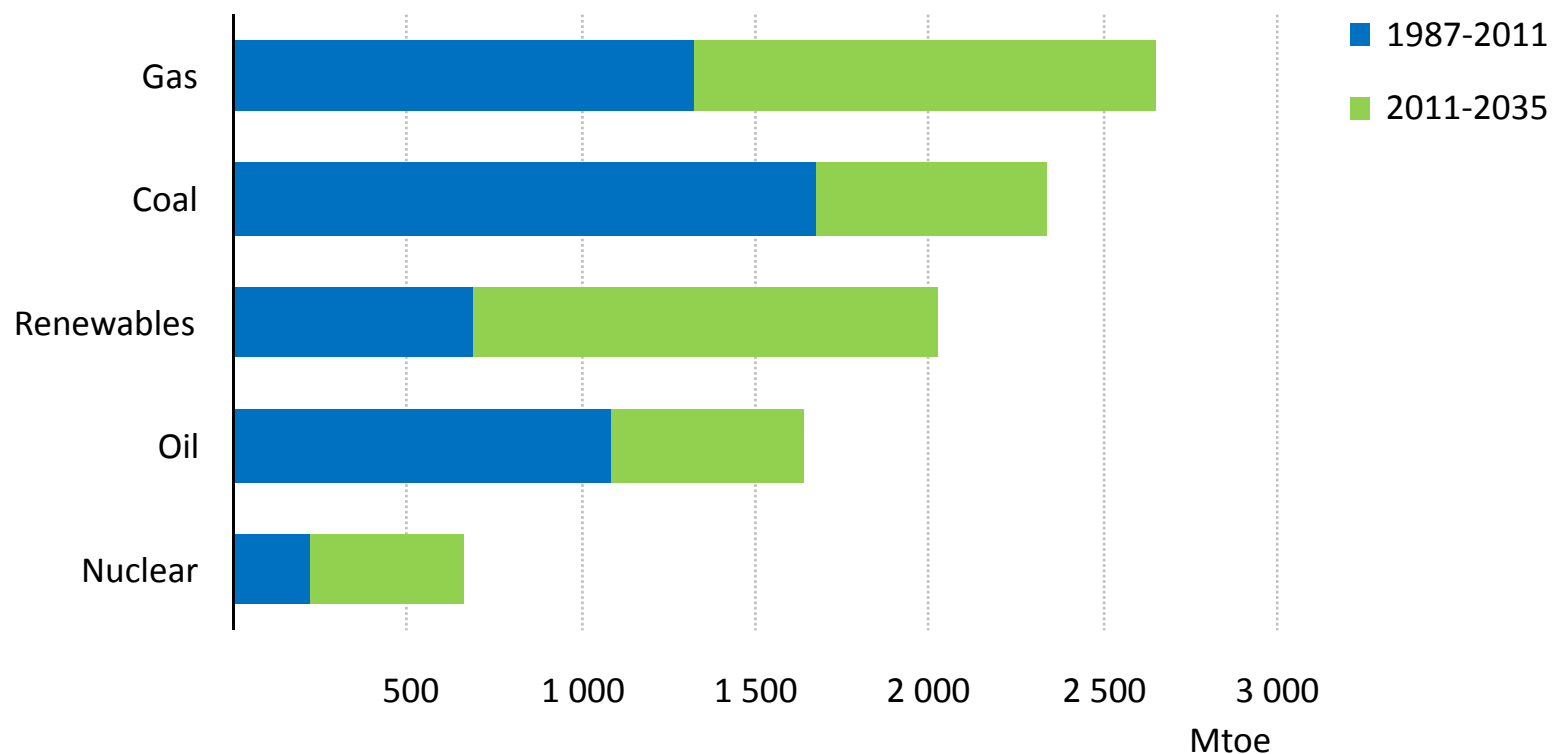
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# The world energy scene today

- **Some long-held tenets of the energy sector are being rewritten**
  - *Countries are switching roles: importers are becoming exporters...*
  - *... and exporters are among the major sources of growing demand*
  - *New supply options re-orientate the energy trade map*
- **But there still remains a major disconnect between climate change goals & actions being taken to meet them**
- **Energy prices add to the pressure on policymakers**
  - *Sustained period of high oil prices without parallel in market history*
  - *Large, persistent regional price differences for gas & electricity*
- **The geopolitics of energy are being further complicated as new tensions add to other unresolved concerns**

# The energy mix is slow to change

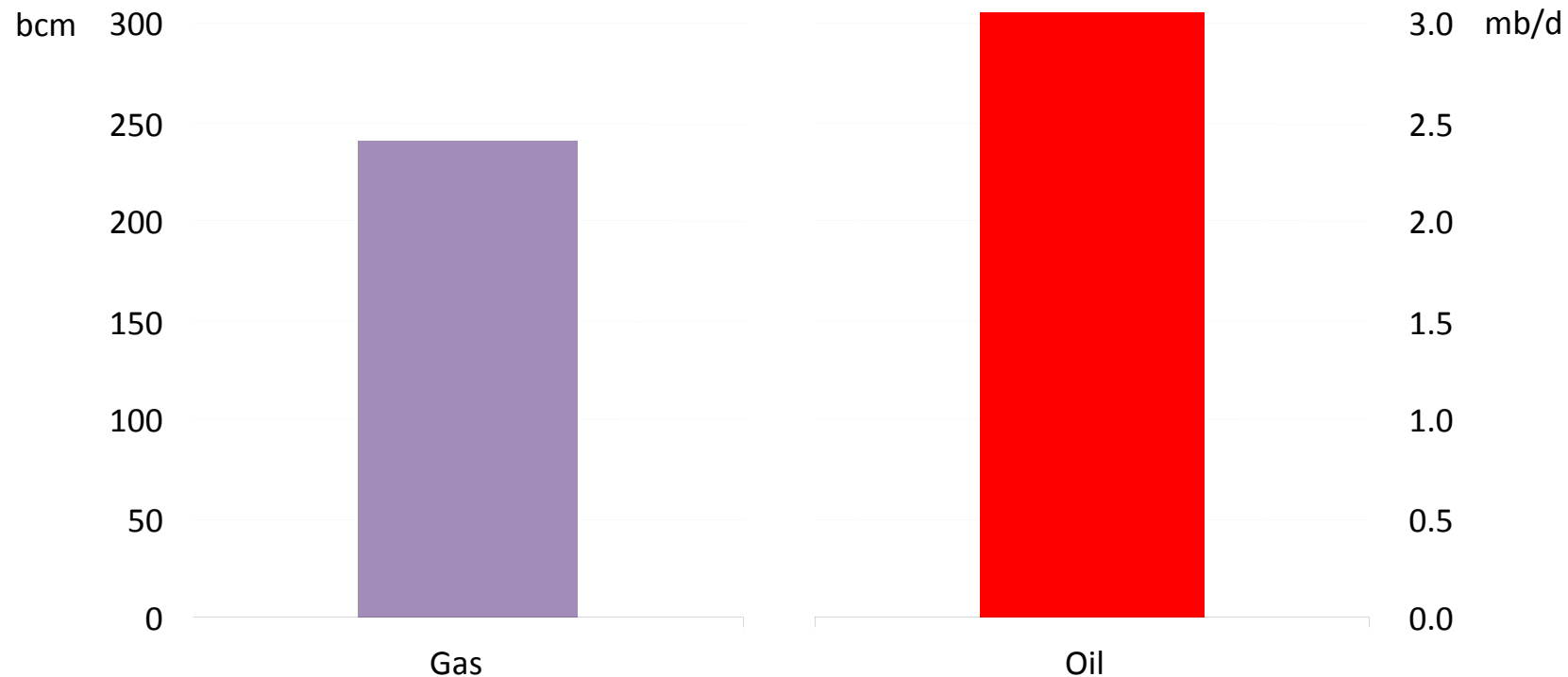
## Growth in total primary energy demand



***25 years ago the share of fossil fuels in the global mix was 82%; it is the same today & the strong rise of renewables in the future only reduces this to around 75% in 2035***

# Unconventional oil and gas has made a major contribution to global production

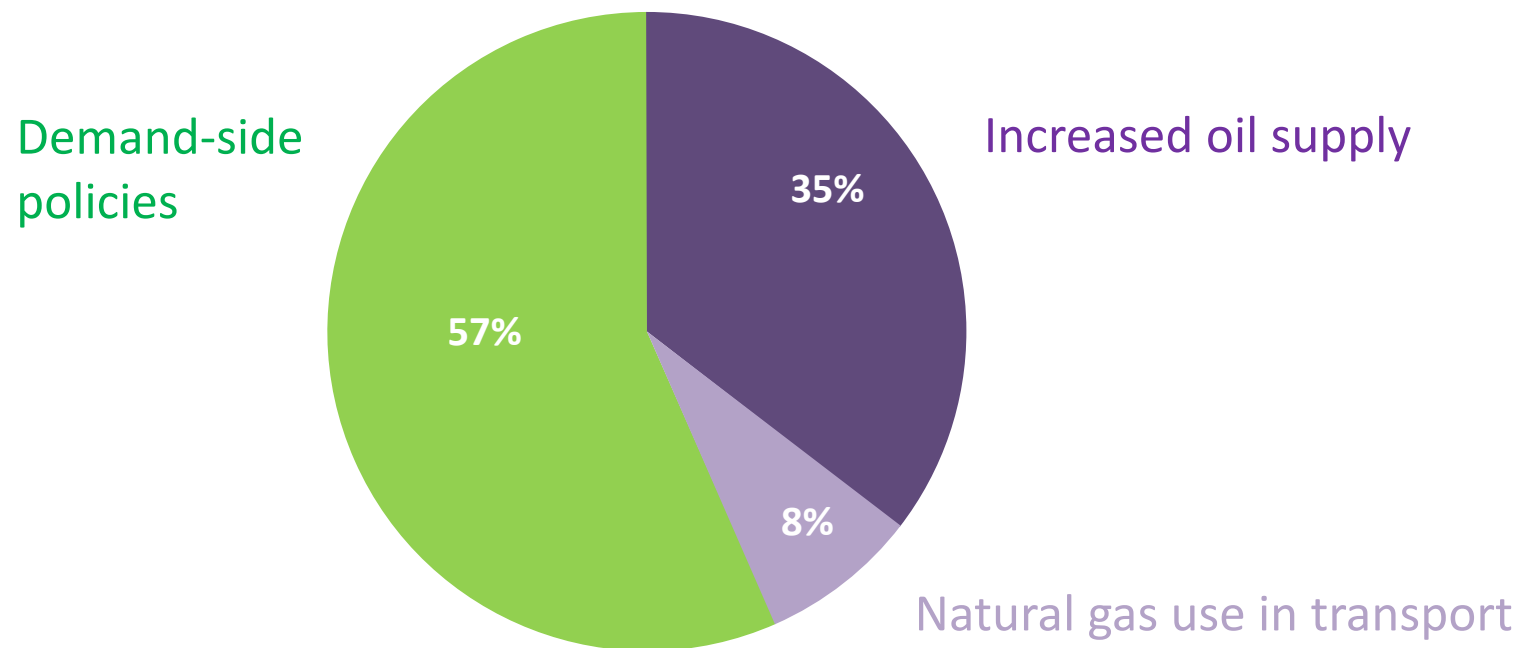
## US shale gas and shale oil production increases: 2005-2014



***Growth in US shale gas since 2005 equals the current output of Qatar + Kuwait + UAE + Iraq; while US shale oil output is now equal to Iraqi oil production***

# Is shale oil the only reason why US oil imports are shrinking rapidly ?

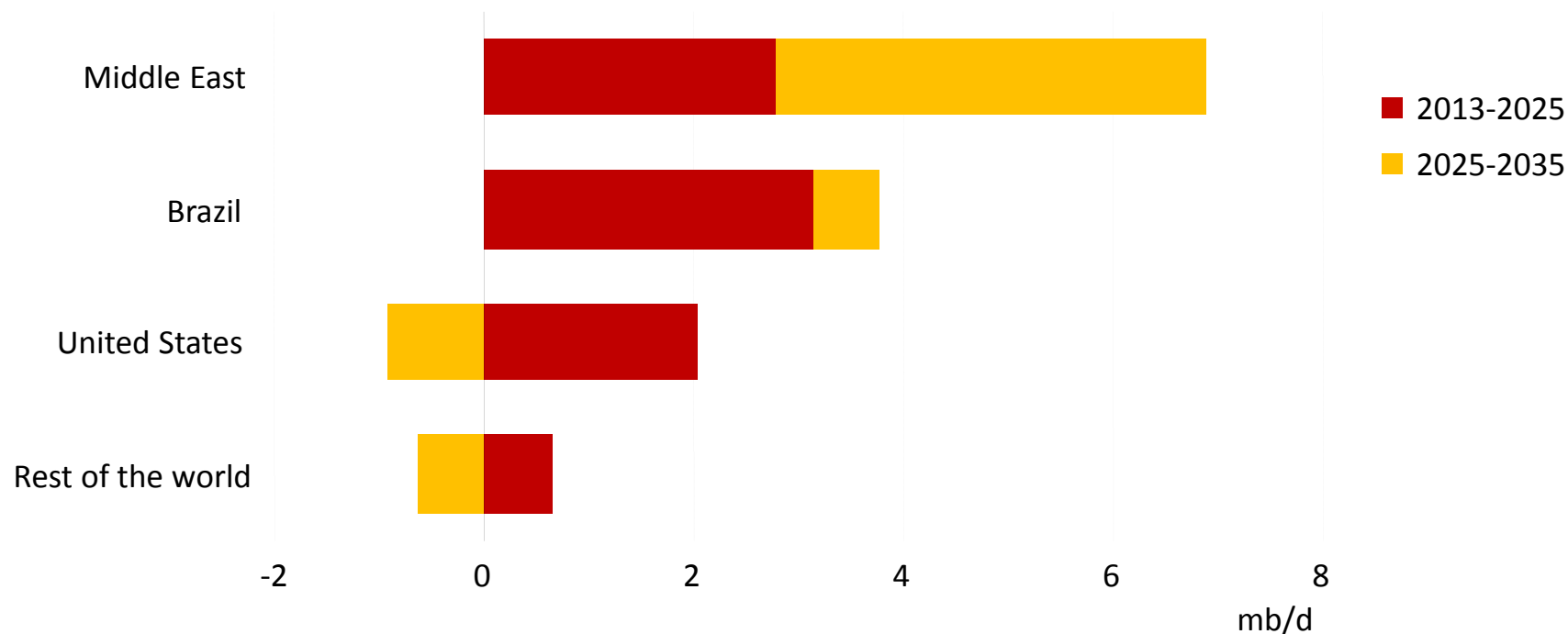
Reductions in US oil imports in 2035 relative to today



***US oil imports are set to plummet due to increasing oil supplies & recently adopted policies to improve efficiency of cars and trucks***

# Two chapters to the oil production story

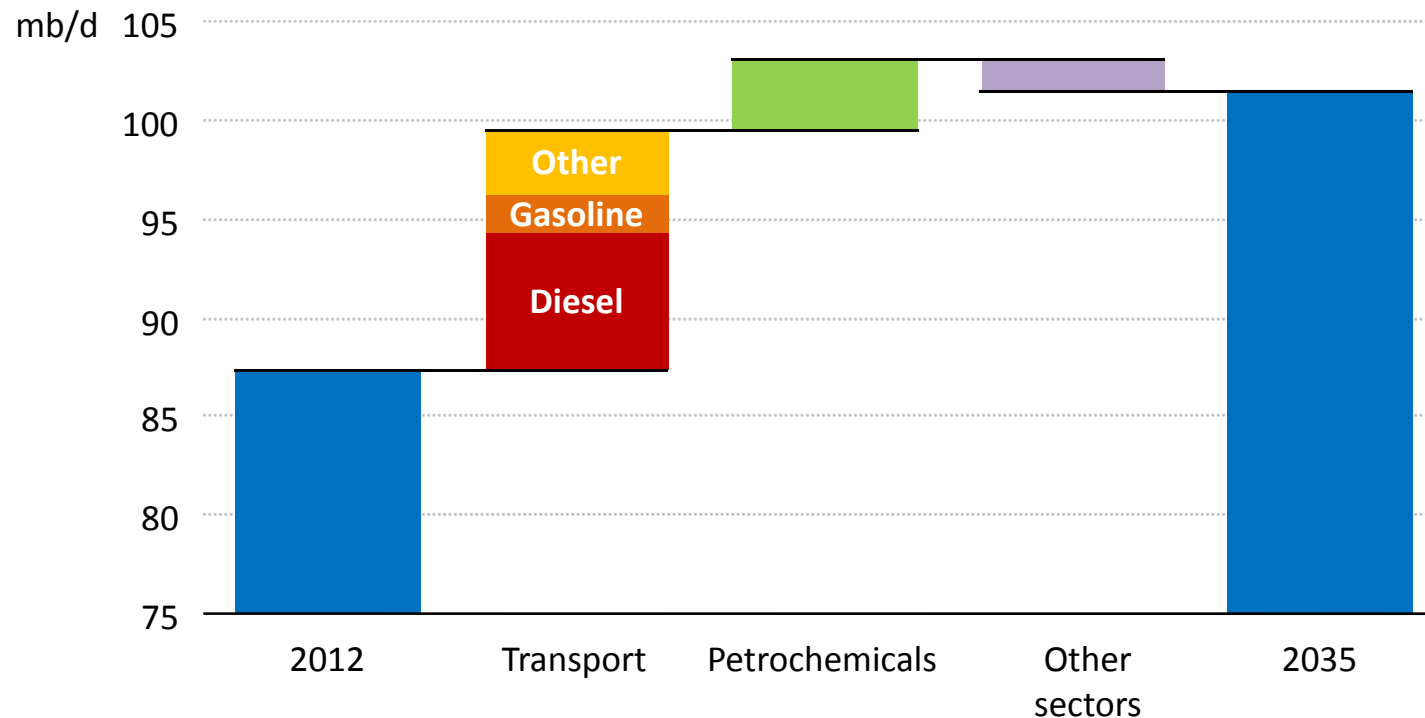
## Contributions to global oil production growth



***The United States (light tight oil) & Brazil (deepwater) step up until the mid-2020s, but the Middle East is critical to the longer-term oil outlook***

# Oil use grows, but in a narrowing set of markets

Oil demand by sector

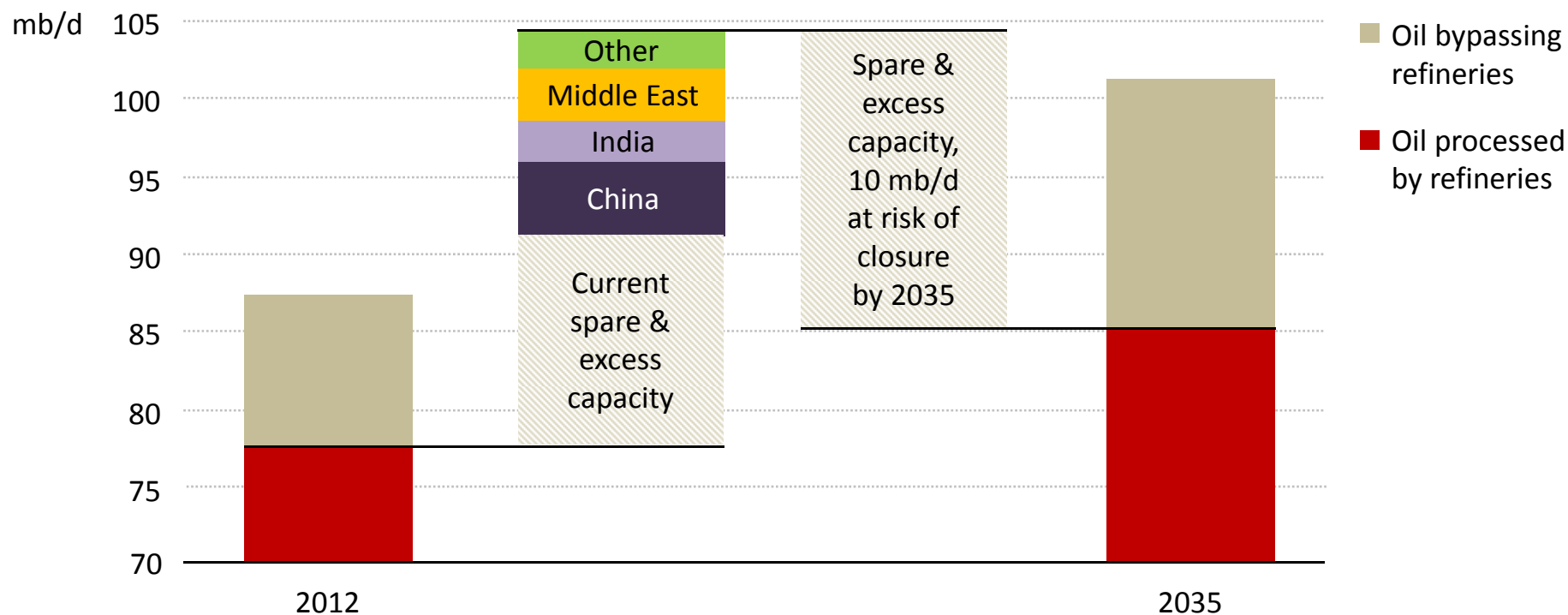


***China becomes the largest consumer of oil by 2030, as OECD oil use drops; demand is concentrated in transport, where diesel use surges by 5.5 mb/d, & petrochemicals***



# Turbulent times for the refining sector

## Refinery capacity and operation

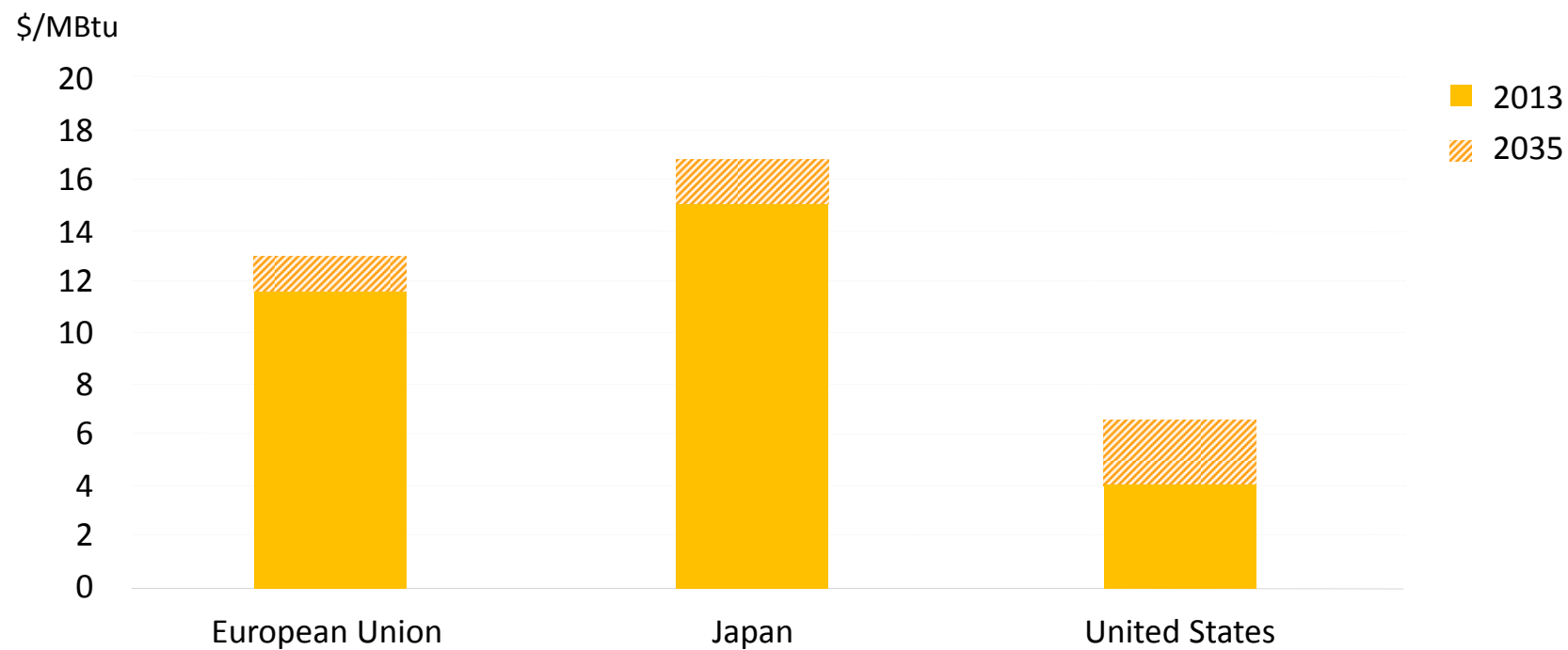


***More oil bypassing the refining system and new capacity in growing non-OECD markets piles pressure on existing refiners, especially in Europe***



# Regional natural gas prices: who has the energy to compete?

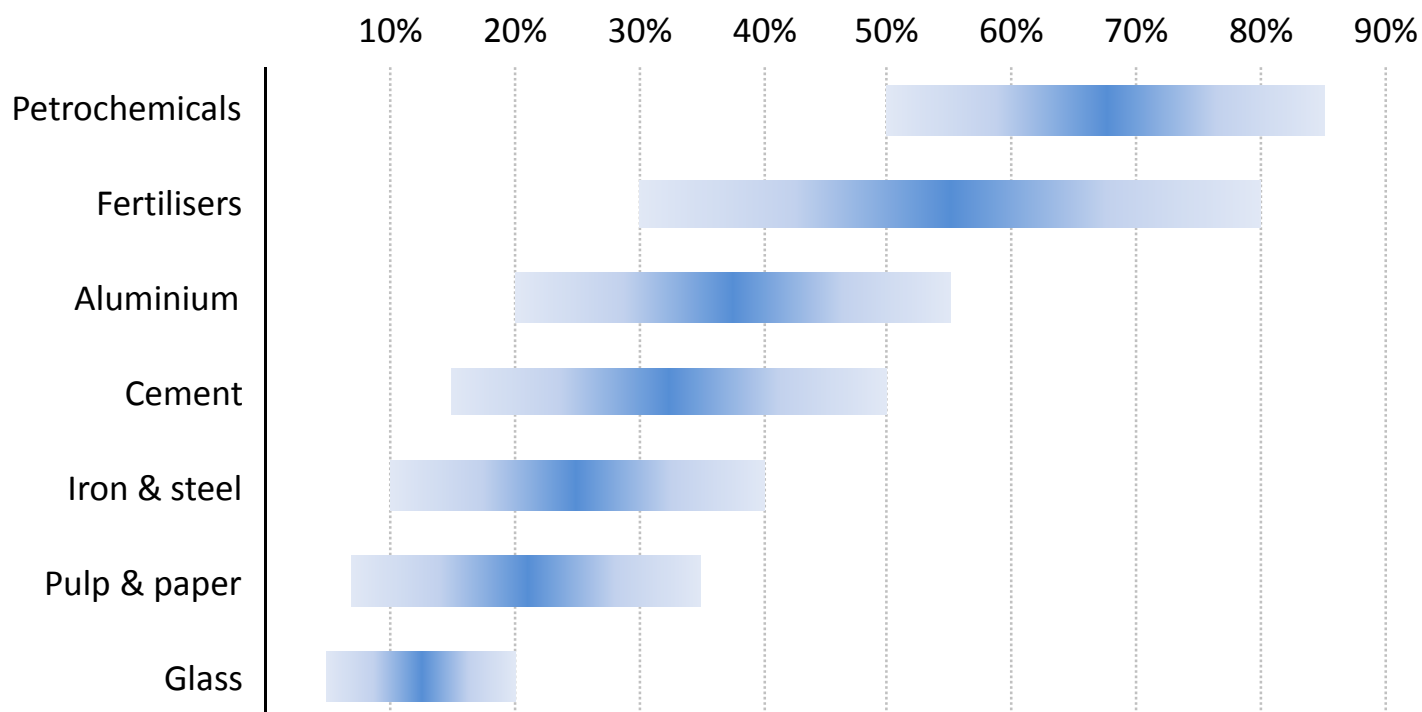
Natural gas prices by region



***Regional differences in natural gas prices narrow from today's very high levels but remain large***

# Energy-intensive industries need to count their costs

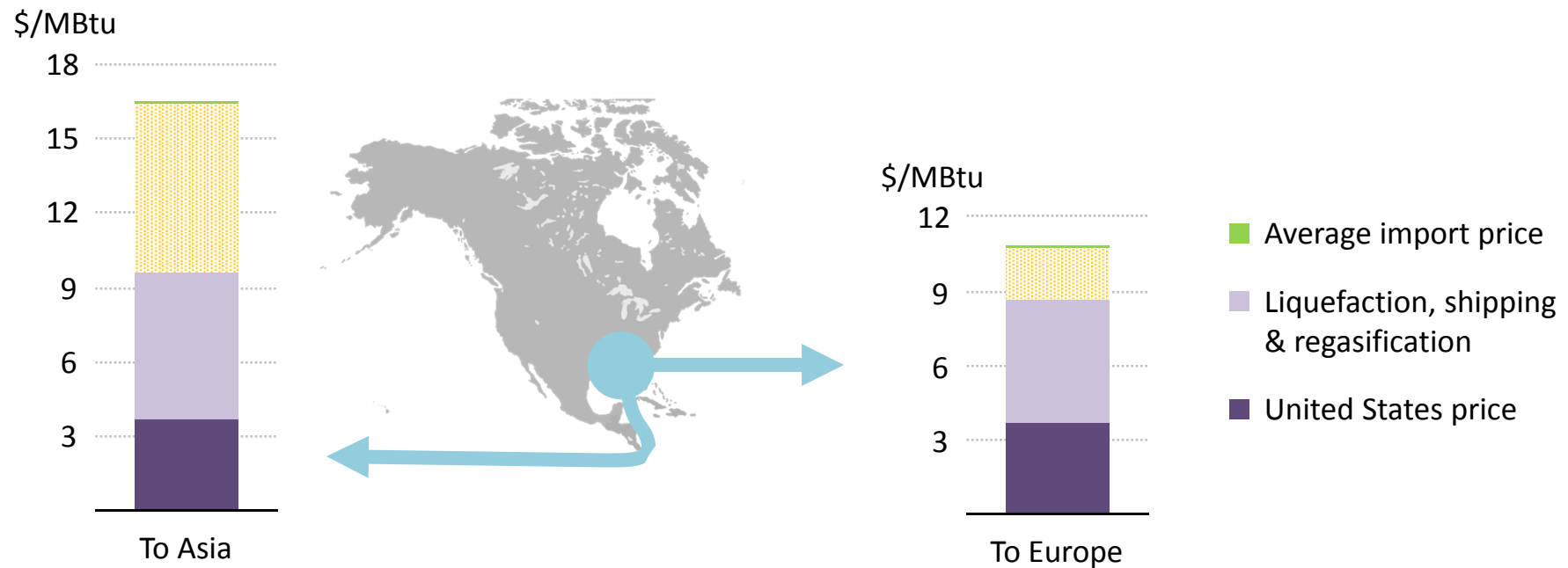
Share of energy in total production costs for selected industries



***Energy-intensive sectors worldwide account for around one-fifth of industrial value added, one-quarter of industrial employment and 70% of industrial energy use.***

# LNG from the United States can alleviate strain on the gas markets, but is no silver bullet

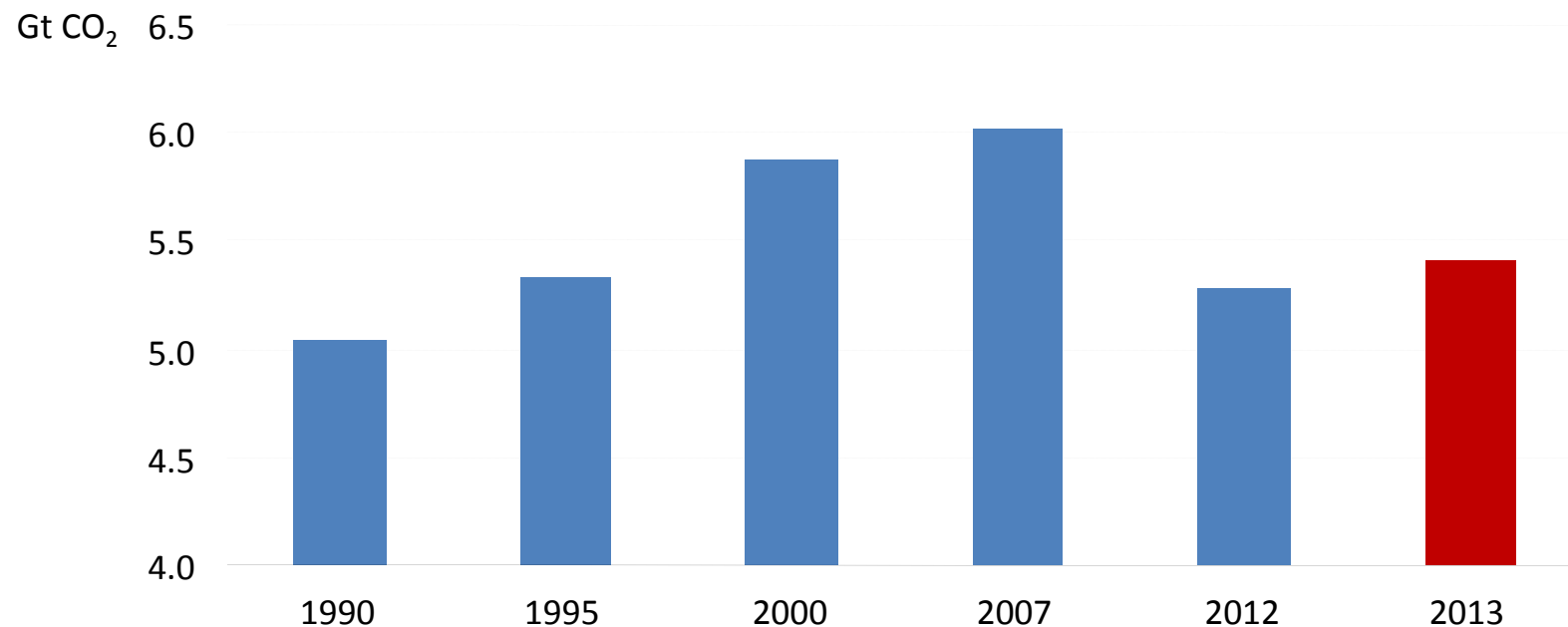
## Indicative economics of LNG export from the US Gulf Coast



***New LNG supplies accelerate movement towards a more interconnected global market, but high costs of transport between regions mean no single global gas price***

# US emissions on a downward trend

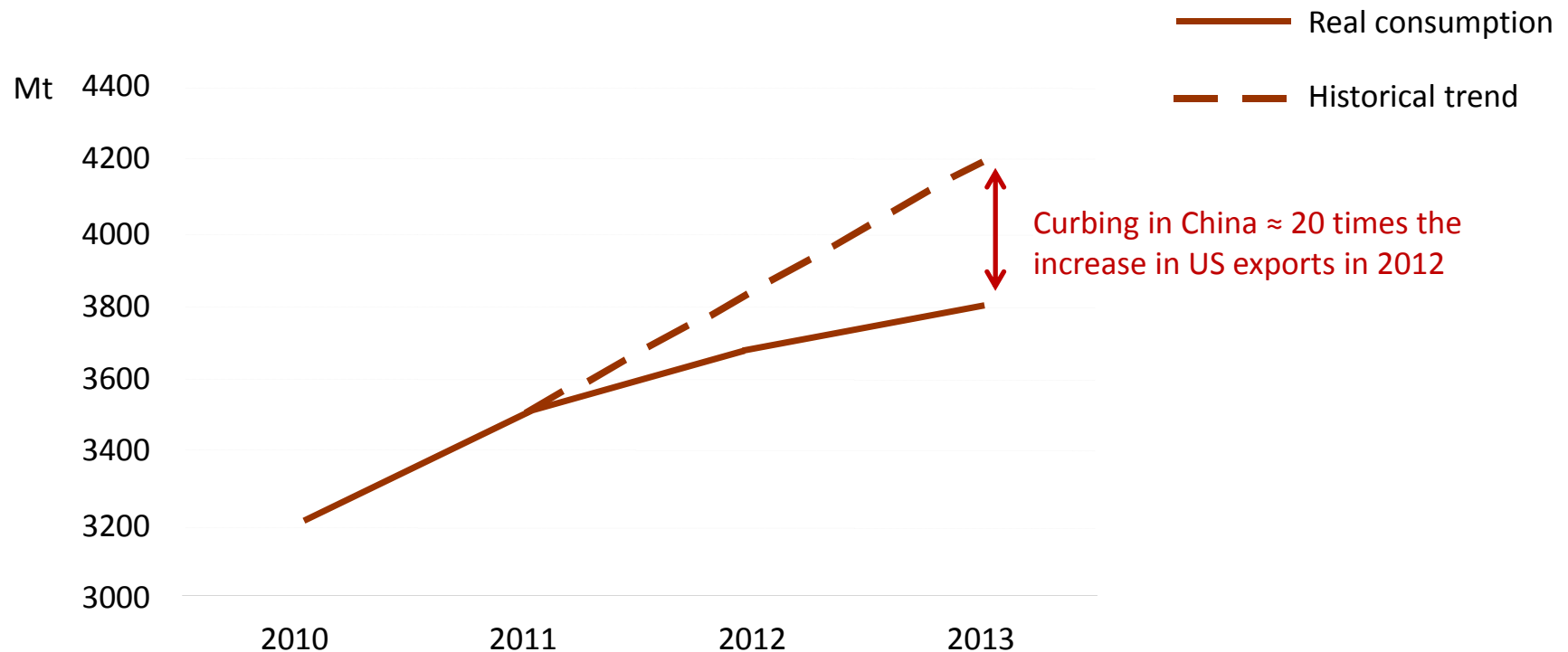
## Energy-related CO<sub>2</sub> emissions in the United States



*CO<sub>2</sub> emissions fell sharply since the shale gas revolution, but rebounded last year on the back of a partial gas-coal switch and increased industrial activity*

# The slowdown in Chinese coal demand caught industry off-guard

Coal demand in China: real demand vs historical trend



***China's move away from coal will have a much greater impact on global coal markets than the US shale gas revolution***

## Concluding remarks

- The shale revolution is having an unprecedented impact on the global energy landscape, economy and geopolitics
- Middle East oil will continue to be indispensable to world markets – the right signals to invest must be sent
- New geography and composition of oil demand and supply confront the world's refiners with a complex set of challenges
- While US natural gas prices may rise, large disparities between regions will persist
- Europe's energy strategy needs to focus on competitiveness & energy security, in addition to climate concerns